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been sufficiently attended to, in Mr. Cuff's method of slaughtering, for certainly the animals must suffer great pain in being drawn up by the hind legs into the divisions of the frame; which though it is not of long duration, yet should not be inflicted: we should therefore recommend, that when Mr. Cuff's apparatus is used, the animals before they are hoisted up, after being attached to the bottom of the division, should be pithed, as it is called, by dividing the spinal marrow near the head, with a small strong knife, inserted between the vertebrae of the neck.

Mr. Cuff's apparatus might be found useful at Belfast, Waterford, Cork, and our other towns where great numbers of cattle are slaughtered; though we speak of this with some doubt, for the great strength of oxen would enable them to do much mischief to the other cattle, while the operation of hoisting first commenced. The process described could not be used for hogs, at least in the order mentioned, because their skins must be either singed or scalded to get the hair off, and it would answer no purpose to hoist them up into the divisions before this was done.

Patent of Mr. Thomas Wells, of Erdington, Warwick, for an improved method of constructing Barrel-cocks, and Water-cocks, dated June 1869.

The description given in the specification, of this improvement on water cocks, is contained in the following words.

"The superior excellence, of these cocks, depends on the construction of that part of the cock, which contains the plug or key, and is called the barrel, so that it cannot leak, and that no liquor can pass through it except when the key or plug is turned for that purpose. This is accomplished, by making grooves in the inside of the barrel of about the eighth of an inch deep, and filling up the grooves with leather, hat (felt) or any thing else of a similar nature, that will absorb the wet. The number or direction of the grooves is not material."

A drawing accompanies the spe-

cification representing a section of the barrel of a cock divided by four vertical grooves, and two annular grooves of the kind above described one above and the other below the aperture.

Remarks.... The statement of the Patentee, "that the position and number of the grooves is not material," is evidently not correct. A little reflection will show that the number of them, and their position, represented in the drawing, as above mentioned, is essential to prevent leakage; the annular stuffings preventing the liquor passing upwards or downwards through the barrel of the cock, and the vertical ones preventing its passing through the vent: two vertical grooves might perhaps secure it, and though a greater number could not make it less staunch, yet this number is at least necessary.

It would seem that the purpose would be answered equally well by making the grooves in the plug as in the barrel, which would have the advantage of being more easily effected, and would also admit of having the stuffing applied with more firmness, and with more facility.

It is an object of considerable consequence to breweries, to have cocks perfectly staunch; the waste of liquor through bad cocks is alone an object of importance and it is also apprehended that the liquor must get some damage from the cask, ceasing to be full after leakage has taken place. In some of the principal breweries in London, on this account, valves are adopted to retain the beer, instead of cocks, which are opened and closed by skrews, for the greater security; and, with these, leakage, is entirely prevented as far as it depends on this circumstance. The large backs belonging to the brewery of Cox, Curtis, and Co. are secured in this manner.

Suggestions for establishing a Telegraphic intercourse between London and Dublin, by the Rev. James Hall.

Phil. Mag. No. 54, p. 124.

The Rev. Mr. Hall previous to his visit to Ireland, through a great part

of which he has lately travelled, began to study the physical geography of this country. On conversing on this subject with Dr. Thomson of Kensington gravel pits, the doctor told him that the old maps of Ireland, particularly those of the fifteenth century, and about the time of the Spanish Armada, laid down the northern part of this kingdom much nearer the Mull of Cantire, in Scotland, than the modern maps in general do; which induced him to inquire particularly into the real distance between those places. On arriving at Torr-point, Fair head, the nearest point of Ireland to Scotland. Mr. Hall hired a boat, and sailed across to Cantire, but instead of finding the distance from 20 to 30 miles, as laid down in some of our modern maps, he found it to be but eleven miles and a half.

This circumstance suggested to Mr. Hall the great feasibility of establishing a telegraphic communication between England and Ireland, across this narrow channel. It is nearly as far from the telegraph at Putney to the one next to it on the line from London to Portsmouth, as from Torr-point Fairhead in Ireland, to the Mull of Cantire in Scotland; and at another place of communication on the same line the distance between the telegraphs is nearly thirteen miles.

Mr. Bell further observes that in establishing telegraphs between Dublin and Cork, and northward from Dublin to Fairhead, there seems to be no difficulty. Between Fairhead, and the opposite coast of Scotland, he proposes that signals shall be addressed both to the eye and to the ear; those to the ear being calculated to rouse attention, and induce people to look out.

From Cantire information might be sent by a line of telegraphs, through the isles of Arran, Bute, and other places, by Glasgow, Edinburgh, &c. direct to London from Dublin or Cork, and back again in a few minutes.

Mr. Hall concludes with remarking the great importance of conveying speedy information to and from our fleets in the harbour of Cork, as well as to and from those at Portsmouth, Plymouth, and other ports in England, and with stating his opinion that the best way

to have little employment for soldiers, sailors, ships of war, batteries, cannon, telegraphs, &c. is to have plenty of them always in readiness.

Observations..... That so gross a mistatement of the relative position of the north eastern extremity of Ireland, with regard to Great Britain, as is above related, should so long remain unnoticed, is another melancholy proof of the little attention which this country meets with from those whose interest it certainly would be to adopt a different line of conduct: and it is truly extraordinary that while large sums have been expended by government, in determining the geography of the antipodes, in the expeditions under the well known Captain Cooke, and others (which certainly have been very honourable to the nation) that of our own shores should remain in error. Much has been done for the improvement of geography in the present reign, but still much remains to be done, and some of it of a nature, which peculiarly demands attention from the British government. It is to be hoped therefore, that the trigonometrical surveys, which have been considerably advanced in Great Britain, will be completed for that island, and also be extended to Ireland, and that the position of the coasts of a part of the world which British ships now much frequent, those of New Holland, may be ascertained with some degree of precision, the eastern coast alone of that country is known with any accuracy, and all the rest are in such obscurity, as to leave it still in doubt, whether that spacious country is a single island, or is composed of two or more islands, which is somewhat disgraceful to the first maritime nation in the world, after having had the country so long in possession.

There can be little doubt of the advantage of the telegraphic communication proposed by Mr. Hall, or of its feasibility, if what he has stated is as correct, as we are inclined to believe it is. It may perhaps give as striking an idea of the use it may be of, as any other circumstance, to consider, that had such a communication existed between the

two kingdoms at the memorable period when the French Fleet lay so long in Bantry bay, the capture of that fleet by the British Navy, must have been inevitable, as the wind was perfectly favourable during the whole of the time, for British ships to sail from Plymouth, and other English ports, though so adverse to vessels passing from Ireland, that it was above a fortnight from the time, when the French fleet first entered the bay, before an account of the event was conveyed to the British Government.

On the spontaneous ignition of Charcoal, by M.B.G. Sage, director of School of Mines in France.

Journal de Physique, tom. 55, F. 423.

M. de Causigni, appears to be the first who observed that charcoal was capable of being set on fire by the pressure of millstones.

M. Robin, commissary of the powder mills of Essonne, has given an account in the *Annales de Chemie*, No. 35, F. 93, of the spontaneous inflammation of charcoal, from the black-berry bearing alder, that took place the 23d of May 1801, in the box of the bolter, into which it had been sifted; this charcoal made two days before, had been ground in the mill without showing any signs of ignition. The coarse powder that remained in the bolter experienced no alteration. The light undulating flame, unextinguishable by water, that appeared on the surface of the sifted charcoal, was of the nature of Hydrogen gas, which is equally unextinguishable.

The moisture of the atmosphere, of which fresh made charcoal is very greedy, appears to me to have concurred in the developement of the inflammable gas, and the combustion of the charcoal.

It has been observed that charcoal powdered and laid in large heaps, heats strongly.

Alder charcoal has been seen to take fire in the ware-houses, in which it has been stored.

About thirty years ago, I saw the roof of one of the low wings of the mint set on fire by the spontaneous combustion of a large quantity of charcoal, that had been laid in the garrets.

M. Malet, commissary of gunpowder at Poutailler, near Dion, has seen charcoal take fire under the pestle; he also found that when pieces of saltpetre and brimstone were put into the charcoal mortar, the explosion took place between the fifth and sixth strokes of the pestle. The weight of the pestles is 80 pounds each, half of this belonging to the rounded ferule of bell metal, in which each one terminates.

The pestles are raised only one foot, and make 45 strokes in a minute.

In consequence of the precaution now taken, to pound the charcoal, brimstone, and salt-petre separately, no explosions take place, and time is gained in the fabrication, since the paste is made in eight hours, that formerly required twenty-four.

Every wooden mortar contains twenty pounds of the mixture, to which two pounds of water are added gradually.

The paste is first corned; it is then glazed, that is, the corns are rounded, by subjecting them to the rotary motion of a barrel, through which an axis passes: and lastly, it is dried in the sun, or in a kind of stove.

Experience has shewn, that brimstone is not essential to the preparation of gun-powder; but that which is made without it falls to powder in the air, and will not bear carriage.

There is reason to believe that the brimstone forms a coat on the surface of the powder, and prevents the charcoal from attracting the moisture of the air.

The goodness of the powder depends on the excellence of the charcoal; and there is but one mode of obtaining this in perfection, which is by distillation in close vessels, as practised by the English.

The charcoal of the French manufactories is at present prepared in pots, where the wood receives the immediate action of the air, which occasions the charcoal to undergo a peculiar alteration.

Observation. The many dreadful accidents which have happened from explosions in the preparation of gunpowder, renders it a point of humanity to make every circumstance that